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## APPARATUS AND METHOD FOR A SPEAKER MOUNTING SYSTEM INCLUDING A LIGHTPIPE AND A ROTATING BASE STAND

### CO-PENDING APPLICATION

[0001] This application is a continuation-in-part claiming priority date of co-pending U.S. Application Serial Number 10/654,627 entitled "Apparatus and Method for a Speaker Mounting System," filed on September 2, 2003, incorporated herein by reference.

### TECHNICAL FIELD

[0002] The present invention is related to a speaker mounting system. More particularly, the present invention is a speaker mounting system comprising a surface mounting bracket with at least one male attachment mount and a speaker unit defining a plurality of angularly spaced apart female attachment grooves. The at least one male attachment mount removably engages with one of the plurality of angularly spaced apart female attachment grooves providing speaker pointing angle adjustment and lightpipe displays the intensity of an audio signal.

### BACKGROUND ART

[0003] Speaker mounting systems must provide flexibility to a user to strategically position one or more speakers to maximize acoustical listening quality within a given size, shape, or content filled room while maintaining the room's aesthetic quality. This speaker mounting flexibility has become more important with the increased popularity of home theater systems that include speakers of varying types, sizes, and power rating. This flexibility of speaker positioning within a given room is necessary because speakers need to be aligned and pointed within a given size, shape, or content-filled room to maximize high fidelity home theater sound performance.

[0004] Present speaker mounting systems do not provide the needed mounting flexibility. For example, one typical speaker mounting system is a speaker stand, which supports a speaker above a horizontal surface such as a floor. The speaker stand does provide vertical adjustment

and provides limited options to locate a speaker. Another type of speaker mounting system is a fixed mounting bracket that will rigidly attach a speaker to a horizontal or a vertical surface. Some fixed mounting brackets are problematic because they do not provide a fixed speaker pointing angle adjustment. Other mounting brackets may include a base and adjustment arm and may optionally include a pivoting point physically attached between the base and an adjustment arm to adjust the speaker angle. However, this pivoting mounting bracket is problematic because the pivot point plus adjustment arm may not provide an accurate user-defined adjustment angle for the speaker or a secure mount. Further, the pivoting point will wear over time and with use, causing the speaker to fall out of adjustment. Thus, there is a need for a speaker mounting system which will produce and maintain repeatable speaker pointing accuracy and precision, over time and with multiple speaker positioning. Consequently, there is a need for a speaker mounting system that can provide flexibility for a user to position one or more speakers of various types, sizes, and power outputs at several positions within a desired acoustical area. Further, a speaker mounting system is required to provide other additional advantages over presently available speaker mounting systems such as providing a lightpipe for displaying the intensity of an audio signal or a continuously adjustable base with markings for pointing angle adjustment of a speaker unit.

#### DISCLOSURE OF THE INVENTION

**[0005]** Accordingly, the present invention provides a speaker mounting system. The speaker mounting system comprises a surface mounting bracket including at least one male attachment mount and a speaker unit. The speaker unit comprises at least one audio speaker and a semi-circular shaped surface. The semi-circular shaped surface comprising a plurality of angularly spaced apart female attachment grooves. The plurality of angularly spaced apart female attachment grooves are adapted for removably engaging the at least one male attachment mount. As such, the present invention allows a user to attach and to detach an audio speaker from the surface mounting bracket. In addition, the present invention allows a user to position the speaker unit within a surface mounting bracket to adjust the acoustic sound pattern in a given room.

**[0006]** In one embodiment, the at least one male attachment mount is a flanged structure. The modified T-mount mates with the plurality of angularly spaced apart female attachment grooves. In another embodiment, a plurality of angularly spaced apart female attachment

grooves are T-grooves that are incised into the semi-circular shaped surface.

**[0007]** It is a further feature of this invention that the audio speaker includes one or more columns of spaced apart speakers selected from a group consisting of tweeter drivers and midrange drivers. In the alternative, the audio speaker includes one column of speakers forming a linear array of speakers selected from a group consisting of tweeter drivers and midrange drivers. In the alternative, it is an optional feature of this invention that audio speaker comprises multiple columns of spaced apart speakers or a linear array of spaced apart speakers.

**[0008]** It is an optional aspect of speaker mounting system that semi-circular shaped surface further comprises an angle marking system adapted to store a location for at least one audio speaker, wherein the audio speaker is a column of spaced apart speakers selected from a group consisting of tweeter drivers and midrange drivers.

**[0009]** In another embodiment, the speaker mounting system has a detachable base stand including a base male attachment mount and a speaker unit comprising an audio speaker and a semi-circular shaped surface comprising a plurality of mechanically attached, angularly spaced apart female attachment grooves. The plurality of angularly spaced apart female attachment grooves are adapted for removably engaging the base male attachment mount.

**[0010]** One benefit of this attachment and detachment method is that the speaker unit may be relocated to a location that is more acoustically desirable for a user's listening pleasure. Further, this inventive speaker mounting system allows a speaker unit to be slide in and out of the surface mounting bracket multiple times without the need for tools or complicated removal schemes while a friction fit between mating surfaces will secure the speaker unit to the surface mounting bracket. In contrast, prior art wall mounting brackets require a user to physically disconnect the speaker from a wall using tools, such as a screwdriver or a wrench. Further, changing mounting location of prior art wall mounting brackets requires a user to drill new holes which will damage the mounting surface.

**[0011]** Another benefit of this invention is that it allows a user to accurately replace a speaker in the same speaker pointing angle adjustment from which it was taken from. This benefit is the result of a plurality of angularly spaced apart female attachment grooves that are fixed in position which allow repeatable speaker unit adjustment in discrete spaced degree increments even after many attachments and detachments of a speaker unit. In contrast, prior art wall brackets that pivot may not accurately or with repeatable results provide alignment of a speaker

unit because the pivot, which may be a wall bearing or riveted joint, will over time wear, producing inaccurate speaker pointing angle adjustment. Further, proper speaker pointing angle adjustment is critical for a home theater entertainment center because a user wants the best sound quality for a given acoustical area.

**[0012]** In another feature of the present invention, a lightpipe is disposed within a speaker unit to display the intensity of an audio signal. In one preferred embodiment of the present invention, the lightpipe is tube comprising an acrylic material.

**[0013]** In another feature of the present invention that a speaker unit includes planar speakers. In one preferred embodiment of the present invention, planar speakers comprise ribbon speakers. In another preferred embodiment of the present invention, planar speakers comprise ribbon speakers, quasi ribbon speakers, ElectroStatic Loudspeakers (ESL), Distributed Mode Loudspeakers (DML), and the like.

**[0014]** In a third embodiment of the present invention, a rotating base stand feature is depicted. In the third embodiment, the rotating base stand comprises a ball bearing, a ring, and a shaft. Shaft mates with the ring to provide a solid connection. The ring mates with an inner ring disposed on a ball bearing. A shaft speaker unit cooperates with shaft to provide a mechanical connection. A user can rotate shaft speaker unit to rotate the direction of audio sound emitted by shaft speaker unit. In this embodiment, shaft speaker unit has a center of gravity near the rotating base stand so that the shaft speaker unit will not rotate. Further, in an alternative embodiment, angular marking may be located along the rotating base stand so that a user may remove a shaft speaker unit from a base stand and later replace the speaker, if desired, on a similar angular marking.

**[0015]** In a fourth embodiment of the present invention, a female mating surface mounting bracket includes a plurality of angularly spaced apart female attachment grooves. Also, a male mating speaker unit comprising an audio speaker and a male mating shaped surface defining a male attachment mount.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0016]** For a better understanding of the present invention, reference is made to the below-referenced accompanying drawings. Reference numbers refer to the same or equivalent parts of the present invention throughout the several figures of the drawings.

[0017] Fig. 1 is a perspective view of the speaker mounting system according to a first embodiment of the present invention.

[0018] Fig. 2A is a perspective view showing at least one male attachment mount of a surface mounting bracket according to the first embodiment of the present invention.

[0019] Fig. 2B is a side view of a surface mounting bracket showing connecting angle  $\theta$  of a bracket arm to a bracket connecting surface according to first embodiment of the present invention.

[0020] Fig. 2C is a side view of an alternative of the first embodiment of the present invention showing a semi-circular shaped surface mounting bracket.

[0021] Fig. 3A is a front view showing a speaker unit including multiple spaced apart speakers according to the first embodiment of the present invention.

[0022] Fig. 3B is a perspective view showing a plurality of angularly spaced apart female attachment grooves of a speaker unit according to the first embodiment of the present invention.

[0023] Fig. 4 is a perspective view showing the mechanical cooperation of a male attachment mount of surface mounting bracket and a plurality of angularly spaced apart female attachment grooves of speaker unit according to the first embodiment of the present invention.

[0024] Fig. 5 is a perspective view showing a speaker unit attached to a detachable base unit according to the second embodiment of the present invention.

[0025] Fig. 6A is a top view showing a detachable base male attachment mount according to the second embodiment of the present invention.

[0026] Fig. 6B is a side view showing a detachable base male attachment mount according to the second embodiment of the present invention.

[0027] Fig. 7A displays a lightpipe disposed within a speaker unit.

[0028] Fig. 7B shows a driver circuit for a light source that is a LED for displaying of the intensity of the audio signal to a speaker unit.

[0029] Fig. 8 shows another feature of the present invention, a speaker unit that includes planar speakers.

[0030] Fig. 9 is a top view of a third embodiment of the present invention showing a rotating base stand.

[0031] Fig. 10 is a perspective view showing a male attachment mount of a speaker unit according to the fourth embodiment of the present invention.

## MODES FOR CARRYING-OUT THE INVENTION

[0032] Referring particularly to Fig. 1, a perspective view of a speaker mounting system 10 according to a first embodiment of the present invention is shown. The speaker mounting system 10 is used to provide flexibility for a user to position one or more of various type, size, and power output speakers at various locations and at various angles within a desired acoustical area with repeatable speaker pointing accuracy and precision. Speaker mounting system 10 is an apparatus for mounting a speaker unit 12. Speaker mounting system 10 comprises a surface mounting bracket 14 and a speaker unit 12.

[0033] Referring particularly to Fig. 2A, a perspective view is shown of a male attachment mount of a surface mounting bracket according to the first embodiment of the present invention. Specifically, Fig. 2A depicts surface mounting bracket 14. Surface mounting bracket 14 is preferably composed of an extruded aluminum material. In the alternative, surface mounting bracket 14 may be any hard, medium durability and strength material, for example, wood, fiberglass, steel, plastic, aluminum, alloy metal, composite metal, or the like. Surface mounting bracket 14 further comprises a bracket connecting surface 18 and at least one male attachment mount 20. Bracket connecting surface 18 has a first connecting means 22. First connecting means 22 is a hole pattern that accepts screws 28 that mechanically attach surface mount bracket 10 to a surface, for example a wall.

[0034] In this preferred embodiment, a male attachment mount 20 is a modified T-mount that is preferably made from an extruded aluminum material. In the alternative, a male attachment mount 20 may be composed of steel, wood, aluminum, fiberglass, metal alloy, aluminum alloy, or a like material. As shown in Fig. 2B, male attachment mount 20 is mechanically connected at an angle  $\theta$  38 to a bracket arm 30 that mechanically connects to a bracket connecting surface 18. Angle  $\theta$  38 provides a speaker unit 12 an adjustment mechanism that is built into surface mounting bracket 14. Angle  $\theta$  38 may be any angle approximately between 0 degree and 90 degrees relative to bracket arm 30 with the preferred range approximately 35 degrees to approximately 55 degrees. As such, a user has one speaker mounting positioning and pointing flexibility option by using a bracket arm. Surface mounting bracket 14 may have length in a range of approximately 2 inches to approximately 30 inches, with the preferred range approximately 5 inches to approximately 15 inches. Surface mounting bracket 14 may have width in a range of approximately 1 inch to approximately 6 inches, with the preferred range

approximately 1 inch to approximately 3 inches. In one alternative of the present embodiment, as shown in Fig. 2C, a surface mounting bracket 14 may be semi-circular shaped with one or more attaching features that may be connected at varying angles  $\Phi$  providing more angular flexibility to position a speaker unit 12 with at least one receiving feature. In another alternative of the present embodiment, a surface mounting bracket is two smaller brackets. Further, the size, the material, the insertion point, and the location of a surface mounting bracket, at least one male attachment mount, a first connecting surface, a bracket arm, and at least one male attachment mount set forth herein are only exemplary in nature.

**[0035]** Fig. 3A is a front view for a plurality of angularly spaced apart female attachment grooves of a speaker unit according to the first embodiment of the present invention. Specifically, Fig. 3A depicts a speaker unit 12 comprising a first column of audio speakers 40A covered by a first grill 45A and a second column of audio speakers 40B covered by a second grill 45B. Fig. 3B depicts a second column of audio speakers 40B covered by a second grill 45B. First column of audio speakers 40A are spaced apart speakers including woofer drivers 42A covered by first grill 45A. In an alternative embodiment, the woofer drivers may be replaced by midrange drivers. Second column of audio speaker 40B are spaced apart speakers including tweeter drivers 42B covered by second grill 45B. First column 40A and second column 40B of audio speakers have a length within the range of approximately 1 feet to 9 feet with the preferred length range of approximately 1.5 feet to 3 feet. First column 40A and second column 40B of audio speakers has a width within the range of approximately 3 inches to 12 inches with the preferred width range of approximately 5 inches to 7 inches. In Fig. 3A, woofer drivers 42A are pointed upward. Speaker unit 12 is made a composite material of wood baffle enclosing spaced apart speakers 42. In the alternative, woofer drivers 42A may be individually tilted or repositioned within the column to produced a desired acoustical level within a room.

**[0036]** Fig. 3C is a perspective view showing a plurality of angularly spaced apart female attachment grooves of a speaker unit according to the first embodiment of the present invention. In the alternative, first column 40A and second column 40B may be a spaced apart speakers to form a linear speaker array. The linear speaker array will allow a user to create a customized constructive and destructive audio interference pattern to tailor the acoustical pattern for a given room size or area fill. In another alternative, audio speaker may be multiple columns of spaced apart speakers that form the linear array to produce a desired directional

acoustical pattern comprising constructive and destructive sound interference patterns. Speaker unit 12 further comprises a semi-circular shaped surface 41 defining a plurality of angularly spaced apart female attachment grooves 44. Plurality of angularly spaced apart receiving features 44 are adapted to mate with male attachment mount 20 on surface mounting bracket 14.

**[0037]** Plurality of angularly spaced apart female attachment grooves 44 are T-grooves having a separation angle  $\beta$  measured from the center point of the semi-circular shaped surface 41. Plurality of angularly spaced apart female attachment grooves 44 allow a user flexibility in selecting the proper location for positioning speaker unit 12. Plurality of angularly spaced apart female attachment grooves 44 are adapted for removably engaging male attachment mount 20. The spacing of plurality of angularly spaced apart female attachment grooves 44 may be uniform, irregular, or any other chosen user desire pattern in between to produce a desired speaker pointing angle adjustment. In the alternative, semi-circular spaced surface 41 may be any surface selected from a group consisting of flat, rectangular, oval, rounded, and partially hemispherical in shape.

**[0038]** Plurality of angularly spaced apart female attachment grooves 44 may be marked so that an user can accurately record or replace a speaker unit that has been previously removed. Also, the marking allows a user to correctly choose the desired pointing angle adjustment position. Plurality of angularly spaced apart female attachment grooves 44 are preferably made of an extruded aluminum material. In the alternative, plurality of spaced apart receiving grooves 44 are may be composed of steel, wood, aluminum, fiberglass, metal alloy, aluminum alloy, and a like material. Further, an audio speaker may be made of any medium durability and strength material such as fiberglass, wood, steel, aluminum, or metal alloy. Further, the size, the material, the insertion point, and the location of the spaced apart receiving feature and the semi-circular shaped surface features set forth herein are only exemplary in nature.

**[0039]** Fig. 4 shows a perspective view of the speaker mounting system 10 according to the first embodiment of the present invention, showing the mechanical cooperation of the at least one male attachment mount 20 of surface mount bracket 14 and a plurality of angularly spaced apart female attachment grooves 44 of speaker unit 12. As shown in Fig. 4, to attach speaker unit 12, male attachment mount 20 is inserted into and engages one of a plurality of angularly spaced apart female attachment grooves 44 until speaker unit 12 is securely positioned within one of plurality of angularly spaced apart female attachment grooves 44. A friction fit between



engaged angularly spaced apart female grooves 44 and male attachment mount 20 secures speaker unit 12. To detach speaker unit 12 from surface mounting bracket 14, speaker unit 12 is slide away from surface mounting bracket 14 until plurality of angularly spaced apart female attachment grooves 44 are not connected to male attachment mount 20 and speaker unit 12 is removed. In yet another preferred embodiment of the present invention, a locking screw (not shown in Figure) secures the engaged angularly spaced apart female groove 44 with male attachment mount 20.

**[0040]** Fig. 5 is a perspective view of speaker mounting system 10 according to a second embodiment of the present invention showing the perspective view of a speaker unit 12 attached to a floor mount detachable base stand 59. In this embodiment, a speaker mounting system comprises a floor mount detachable base stand 59 including a floor male attachment mount 65. Floor male detachable base stand 59 is preferably made from extruded aluminum material. In the alternative, floor mount detachable base stand 59 may be composed of a hard, durable material such as steel, a wood, an aluminum, a fiberglass, a metal alloy, an aluminum alloy, a plastic, or a like material. In this embodiment of the present invention, speaker unit 12 preferably is a center channel speaker.

**[0041]** Fig. 6A is a top view showing a base male attachment mount 62 according to the third embodiment of the present invention. In Fig. 6, detachable base stand 60 includes a base male attachment mount 62 that mate with a plurality of angularly spaced apart female attachment grooves 44 on a semi-circular shaped surface 41 of a speaker unit 12. Base male attachment mount 62 are adapted for removably engaging a plurality of angularly spaced apart female attachment grooves 44 on a semi-circular shaped surface 41 of a speaker unit 12, whereby friction fit between the surfaces maintains the speaker pointing angle adjustment. The removable sliding feature allows a user an easy method without the need for tools to detach and to reattach a speaker unit 12 from the detachable base stand 60. Fig. 6B shows a side view of base male attachment mount 62 on the detachable base stand 60. Further, base male attachment mount 62 may be marked so that a user may remove a speaker unit 12 from a base stand and later replace the speaker, if desired, on the same marks. Finally, the type, location, or spacing of the base stand and the other features such as detachable base male attachment mount and plurality of angularly spaced apart female attachment grooves are only meant to be to exemplary in nature.

**[0042]** Fig. 7A displays a lightpipe 65 disposed within a speaker unit 12. In this embodiment of the present invention, the lightpipe 65 is disposed within a speaker unit 12 to display the intensity of an audio signal. In one preferred embodiment of the present invention, the lightpipe 65 is a hollow tube comprising an acrylic material. In this preferred embodiment of the present invention, lightpipe 65 further comprises a first end 66 and a second end 68, wherein first end 66 and second end 68 are illuminated by a light source 70 such as a Light Emitting Diode (LED).

**[0043]** Fig. 7B shows a driver circuit for light source 65 that is a LED for displaying of the intensity of the audio signal to a speaker unit. In particular, an audio signal is input to speaker unit 12. The audio signal is electrically connected to differential input ports 72 of an amplifier 74. In the preferred embodiment, the amplifier is an operational amplifier, but in other preferred embodiments, may be any similarly functioning amplifying circuit or device. Amplifier 74 adjusts the level of the audio signal and converts the audio signal, which is a differential input signal, to a single-ended output signal 75. Afterwards, signal-ended output signal 75 is electrically connected to an active rectifying circuit 76, which active rectifying circuit 76 is in this preferred embodiment another operational amplifier. Active rectifying circuit 76 adjusts the amplitude signal level and converts single-ended output signal 75 to a rectified output signal 77.

**[0044]** A peak stretching circuit 78 is a user selectable time-delay element comprising a capacitor 79 and a resistor 80 to ensure that the peak values are retained long enough to be seen. The peak values of which are adjusted to best create a visual representation of the aural experience. The current mode operation of the LED allows for the most useable range for the illumination and mating of the dynamic range of an LED to the wide dynamic range of audio signals. Finally, peak stretching circuit 78 is electrically connected to output impedance buffering circuit 81, which is in the preferred embodiment, an active current source follower to provide a low output impedance to light source 65 which light source is an LED. Afterwards, the LED illuminates first end 66 and optionally second end 68 of lightpipe 65 with an intensity proportional to the level of the audio signal. In the preferred embodiment, lightpipe 65 illuminates a wall (not shown in Figure) proximal to speaker unit 12, thereby providing a light intensity that is proportional to the intensity of the audio signal. In another embodiment, the LED provides background light on an adjacent surface for creating a visual theme or a visual mood, In other preferred embodiments of the present invention, a lightpipe comprises a

material such as Lexan, a plurality of optical fibers, a fluorescent light source, an incandescent light source, or a phosphorescent light source.

**[0045]** Fig. 8 shows another feature of the present invention, a speaker unit includes planar speakers. In one preferred embodiment of the present invention, planar speakers comprise ribbon speakers. In another preferred embodiment of the present invention, planar speakers comprise ribbon speakers, quasi ribbon speakers, ElectroStatic Loudspeakers (ESL), Distributed Mode Loudspeakers (DML), and the like. Planar speakers differ from conventional speakers in that planar speakers have a substantially flat, planar, or sheet-like transducer element, while conventional speakers have a conical transducer element. Because of the flat transducer element, planar speakers do not require the depth of a speaker having a conical transducer element, and thus are advantageous for use in applications with limited depth. In one preferred embodiment, planar speakers are included as dipoles with several feet inbetween, wherein the dipoles are positioned several feet away from a surface, such as an adjacent wall. In another embodiment, planar speakers that are electrostatic loudspeakers require a standard power supply.

**[0046]** Known planar speakers include the Magnaplanar® speaker manufactured by Magnepan in White Bear MN, the Planar Focus Technology (PFT™) speakers manufactured by Monsoon Audio, ELS speakers manufactured by MartinLogan in Lawrence, Kansas, and the Distributed Mode LoudSpeaker (DML) developed by NXT Technology in London, United Kingdom. Planar speakers may be used alone or in combination with conventional speakers. In one instance, a standard CD player is electrically connected to a preamplifier such as Lexicon MC12 (not shown in Figure). Preamplifier (not shown in Figure) functions to adjust a level of the audio signal. Afterwards, the audio signal is electrically connected to an input port of a Monster Power amplifier such as MPA 3250 (not shown in Figure). Following, an output port of the Monster Power amplifier is connected to a planar speaker. In yet another instance, the audio signal processing functions maybe performed using one processing circuit residing within the speaker unit.

**[0047]** Fig. 9 is a top view of a third embodiment of the present invention displaying a rotating base stand 82. In particular, Fig. 9 displays rotating base stand 82 which comprises a ball bearing 83, a ring 84, and a shaft 86. Shaft 86 mates with ring 84 to provide a mechanical connection. Ring 84 mates with a ball bearing inner ring 85 which is disposed within ball bearing 83. A shaft speaker unit 88 is mechanically connected with shaft 86. Ring 84 is slid

into ball bearing inner ring 85. A user rotates shaft speaker unit 88 to redirect the direction of audio sound emitted by the shaft speaker unit 88. The forces produced by the weight of shaft speaker unit 88 on the ball bearing 83 plus friction produced by shaft speaker unit 88 on ball bearing 83 will keep the shaft speaker unit 88. Furthermore, shaft speaker unit 88 having a center of gravity 90 located near ball bearing 83 prevents shaft speaker unit 88 from falling over. Further, in an alternative embodiment, angular marking 92 may be located along rotating base stand 82 so that a user may remove shaft speaker unit 88 from a rotating base stand 82 and later replace the shaft speaker unit 88, if desired, on same angular marking 92.

**[0048]** Furthermore, a method for positioning an audio speaker is disclosed. The method comprising the steps of: mounting a shaft speaker unit 88 mechanically connected to shaft connected to a ring 84, inserting ring into a ball bearing inner ring 85 disposed in a ball bearing 83, rotating shaft speaker unit 88 within the ball bearing inner ring 85, selecting an angular marking 92 disposed on the rotating base stand 82; and aligning angular marking 92 with a shaft speaker unit marking 91 disposed on shaft speaker unit 88.

**[0049]** Fig. 10 shows a fourth embodiment of the present invention where a speaker mounting system 94 comprises a female mating surface mounting bracket 95 including a plurality of angularly spaced apart female attachment grooves 44; and a male mating speaker unit 97 comprising an audio speaker (not shown) and a male mating shaped surface 100 defining a male attachment mount 20. Male attachment mount 20 is adapted for removably engaging with plurality of angularly spaced apart female attachment grooves 44. It is yet another feature of the present embodiment that speaker mounting system 94 wherein male attachment mount 20 is a T-mount. It is yet another feature of the present embodiment that speaker mounting system 94 further comprising a lightpipe 102, which lightpipe 102 functions similar to lightpipe 65. The lightpipe 102 is disposed in said male mating shaped surface 100 whereby, said lightpipe 102 is a tube comprising an acrylic material which illuminates a surface (not shown in Figure) proximal to male mating speaker unit 97.

**[0050]** Information as herein shown and described in detail is fully capable of attaining the above-described object of the invention, the present preferred embodiment of the invention, and is, thus, representative of the subject matter which is broadly contemplated by the present invention. The scope of the present invention fully encompasses other embodiments which may become obvious to those skilled in the art, and is to be limited, accordingly, by nothing other than the appended claims, wherein reference to an element in the singular is not intended to mean one and only one unless explicitly so stated, but rather "one or more." All structural

and functional equivalents to the elements of the above-described preferred embodiment and additional embodiments that are known to those of ordinary skill in the art are hereby expressly incorporated by reference and are intended to be encompassed by the present claims.

**[0051]** Moreover, no requirement exists for a device or method to address each and every problem sought to be resolved by the present invention, for such to be encompassed by the present claims. Furthermore, no element, component, or method step in the present disclosure is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. However, one skilled in the art should recognize that various changes and modifications in form and material details may be made without departing from the spirit and scope of the inventiveness as set forth in the appended claims. No claim herein is to be construed under the provisions of 35 U.S.C. section 112, sixth paragraph, unless the element is expressly recited using the phrase “means for.”

#### INDUSTRIAL APPLICABILITY

**[0052]** The present invention relates to a speaker mounting system. More particularly, the present invention applies industrially to a speaker mounting system for speaker pointing angle adjustment and a light pipe for displaying the intensity of an audio signal for a home theater system.